UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,236	06/27/2003	Gopal B. Avinash	135795	8574

7590 09/18/2007

Patrick W. Rasche
Armstrong Teasdale LLP
One Metropolitan Square, Suite 2600
St. Louis, MO 63102

EXAMINER	
TABATABAI, ABOLFAZL	
ART UNIT	**PAPER NUMBER**
2624	

MAIL DATE	DELIVERY MODE
09/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,236	AVINASH, GOPAL B.	
	Examiner	Art Unit	
	Abolfazl Tabatabai	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *amendment filed on June 28, 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-9,13-15,17-20,24-26 and 28-30* is/are rejected.

7)☒ Claim(s) *4,5,10-12,16,21-23,27,31 and 32* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 June 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

FINAL ACTION

Response to Amendments/Arguments

1. Applicant's arguments, see (pages 11-18), filed on June 28, 2007, with respect to the rejection(s) of claims 1-3, 6-9, 25, 26 and 28-30 under Harvey (U. S. 6,275,038 B1) in view of Gur et al (U. S. 5,627,907); Claim 13 Harvey (U. S. 6,275,038 B1) in view of Dean et al (U. S. 6,445,182); Claims 14, 15,17-20 and 24 under Harvey (U. S. 6,275,038 B1) and Dean et al (U. S. 6,445,182) as applied to claim13 above, and further in view of Gur et al (U. S. 5,627,907) have been fully considered and are not persuasive. Therefore, This Office Action Made Final).

2. In remarks, applicants argued in substance that, Harvey does not teach or suggest a method for generating an estimate of inhomogeneity as recited in claim 1, specifically does not describe or suggest a method that includes generating a first and a second estimate of inhomogeneity using an acquired image.

3. However, in response to Applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. The specification is not measure of invention. Therefore, limitations contained therein cannot be read into the claims for the purpose of avoiding the prior art. Ir re Spork, 55CCPA 743, 386 F. 2d 924, 155 USPQ 687 (1968). In the instant case, Harvey clearly reads " a method for evaluating an inhomogenity in a magnetic polarizing field used to acquire an MRI image of a slice of a subject, at point in the slice, the method comprising acquiring data in a k-space for first and second k-space scans of the subject with the single application of a

first MRI pulse sequence, wherein data acquisition for the second k-space scan is delayed with respect to data acquisition for the first k-space scan by a time delay; generating first and second spatial images from the first and second k-space scans; determining a phase difference between values of the first and second spatial images at the point; and evaluating the in homogeneity at the point using the phase difference and the time delay (please note, to column 3, lines 17-29) " a method that includes generating a first and a second estimate of inhomogeneity using an acquired image.

4. In remarks, applicants argued in substance that, prior art does not teach or suggest a computer readable medium with a program configured to instruct a computer as recited in claim 25.

5. However, in response to Applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. The specification is not measure of invention. Therefore, limitations contained therein cannot be read into the claims for the purpose of avoiding the prior art. Ir re Spork, 55CCPA 743, 386 F. 2d 924, 155 USPQ 687 (1968). In the instant case, Gur clearly reads, " a computer readable medium encoded with a program (please note, to column 7, lines 7-14 and column 21, lines 6-16) ".

6. In remarks, applicants argued in substance that, prior art does not teach or suggest MRI imaging system as recited in claim 13.

7. However, in response to Applicant's argument, Examiner would like to point out that claim language is given its broadest reasonable interpretation. The specification is not measure of invention. Therefore, limitations contained therein cannot be read into

the claims for the purpose of avoiding the prior art. Ir re Spork, 55CCPA 743, 386 F. 2d 924, 155 USPQ 687 (1968). In the instant case, Harvey clearly reads " MRI imaging system (please note, to column 3, lines 17-21) ".

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1-3, 6-9, 15, 15, 25, 26 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey (U. S. 6,275,038 B1) in view of Gur et al (U. S. 5,627,907).

Regarding claim 1, Harvey discloses a method for generating an estimate of inhomogeneity, said method comprising:

acquiring an image (please note, to column 3, lines 17-21).

generating a first estimate of inhomogeneity using the acquired image (please note, to column 3, lines 17-29 and column 4, lines 46-63 and column 13, lines 44-52);

generating a second estimate of inhomogeneity using the acquired image (please note, to column 3, lines 17-29 column 4, lines 46-63 and column 13, lines 44-52); and,

generating a final estimate of inhomogeneity using at least the first and second estimates (please note, to column 4, lines 46-63).

However, Harvey is silent about the specific details regarding the steps of:

generating a threshold value using the acquired image;

the threshold value.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprising the steps of:

generating a threshold value (column 14, lines 14-28 and column 17, lines 41-67);

the threshold value (column 17, lines 41-67).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use a threshold value of image as taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Regarding claim 2, Harvey is silent about the specific details regarding a method in accordance with claim 1 wherein said generating a first estimate comprises generating a first estimate by filtering an image gm, said generating a second estimate comprises generating a second estimate of inhomogeneity using an operation other than filtering on an image gm.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises filtering on an image (column 17, lines 41-49).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use image filtering as taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Regarding claim 3, Harvey is silent about the specific details regarding a method in accordance with claim 2, wherein said generating a second estimate comprises generating a second estimate of inhomogeneity by dividing gm by a threshold value of gm (threshold gm).

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises generating a second estimate of inhomogeneity by dividing gm by a threshold value of gm (threshold gm) (column 9, lines 22-31 and column 20, lines 42-52).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use image dividing and threshold value of image as taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Regarding claim 6, Harvey is silent about the specific details regarding a method in accordance with claim 2, wherein said generating a first estimate by filtering an image

gm comprises generating a first estimate by filtering an image gm with a low pass filter. In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises generating a first estimate by filtering an image gm with a low pass filter (column 21, lines 6-11).

Regarding claim 7, Harvey is silent about the specific details regarding a method in accordance with claim 1 wherein said generating a first estimate comprises generating a first estimate by filtering an image gm with a first filter, said generating a second estimate comprises generating a second estimate of inhomogeneity by filtering an image gm with a second filter different than the first filter.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises generating a second estimate of inhomogeneity by filtering an image gm with a second filter different than the first filter (column 31, lines 4-5).

Regarding claim 8, Harvey is silent about the specific details regarding a method in accordance with claim 1 wherein said generating a first estimate comprises generating a first estimate by filtering an image gm with a first low pass filter, said generating a second estimate comprises generating a second estimate of inhomogeneity by filtering an image gm with a second low pass filter different than the first filter.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises

Regarding claim 9, Harvey is silent about the specific details regarding a method in accordance with claim 1 wherein said generating a first estimate comprises generating a first estimate by filtering an image gm with a low pass filter, said generating a second estimate comprises generating a second estimate of inhomogeneity by filtering an image gm with a band pass filter.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises generating a second estimate of inhomogeneity by filtering an image gm with a band pass filter (column 17, lines 33-36).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use first and second low-pass filter and band pass filter as taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Regarding claim 25, Harvey discloses a computer readable medium encoded with a program configured to instruct a computer to:

acquire an image (please note, to column 3, lines 17-21).

generate a first estimate of inhomogeneity using the acquired image (please note, to column 3, lines 17-29 and column 4, lines 46-63 and column 13, lines 44-52);

generate a second estimate of inhomogeneity using the acquired

image(please note, to column 3, lines 17-29 and column 4, lines 46-63 and column 13, lines 44-52); and,

generate a final estimate of inhomogeneity using at least the first and second estimates (please note, to column 4, lines 46-63).

Harvey is silent about the specific details regarding a computer readable medium for storing a program and images and the steps of:

generating a threshold value using the acquired image and the threshold value.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises a computer readable medium for storing a program (please note, to fig. 1, element 2, column 7, lines 7-15 and column 21, lines 6-14).

generating a threshold value (column 14, lines 14-28 and column 17, lines 41-67);

the threshold value (column 17, lines 41-67).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use a computer readable medium for storing a program and a threshold valueas taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Claim 26 is similarly analyzed as claim 2 above.

Claim 28 is similarly analyzed as claim 7 above.

Claim 29 is similarly analyzed as claim 8 above.

Claim 30 is similarly analyzed as claim 9 above.

10. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey (U. S. 6,275,038 B1) in view of Dean et al (U. S. 6,445,182).

Regarding claim 13, Harvey discloses a magnetic resonance imaging (MRI) system comprising:

acquire an image (please note, to column 3, lines 17-21);

generate a first estimate of inhomogeneity using the acquired image (please note, to column 3, lines 17-29 and column 4, lines 46-63 and column 13, lines 44-52);

generate a second estimate of inhomogeneity using the acquired image (please note, to column 3, lines 17-29 and column 4, lines 46-63 and column 13, lines 44-52); and,

generate a final estimate of inhomogeneity using at least the first and second estimates (column 4, lines 46-63).

However, Harvey is silent about the specific details regarding the steps of:

a computer operationally coupled to said receiver, said computer configured to.

a main magnet configured to generate a substantially uniform magnetic field;

a radio frequency pulse generator configured to excite the magnetic field;

a gradient field generator configured to generate gradients extending in different directions in the magnetic field;

a receiver configured to receive magnetic field magnetic resonance (MR) signals representative of an object;

generating a threshold value using the acquired image; and, the threshold value. In the same field (medical imaging) of endeavor, however, Dean discloses geometric distortion correction in MRI comprising the steps of:

a computer operationally coupled to said receiver, said computer configured to (fig. 3 element 110).

a main magnet configured to generate a substantially uniform magnetic field (column 7, lines 47-55);

a radio frequency pulse generator configured to excite the magnetic field (column 7, lines 56-60);

a gradient field generator configured to generate gradients extending in different directions in the magnetic field (column 7, lines 56-60);

a receiver configured to receive magnetic field magnetic resonance (MR) signals representative of an object (column 7, lines 61-66);

generating a threshold value using the acquired image; and, the threshold value (column 11, lines 47-51).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use uniform magnetic field, radio frequency and a receiver and a threshold value as taught by Dean in the system of Harvey because Dean provides Harvey an improved MRI system which is relates to the field of geometric distortion correction in MRI. Using computed tomography is useful in imaging bony structure yet

has limited ability to differentiate between components of inhomogeneous soft tissue structures, such as a brain for example. Also computed tomography provides images of relatively high positional accuracy.

11. Claims 14, 15,17-20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harvey (U. S. 6,275,038 B1) and Dean et al (U. S. 6,445,182) as applied to claim13 above, and further in view of Gur et al (U. S. 5,627,907).

Regarding claim 14, Harvey and dean are silent about the specific details regarding a MRI system in accordance with claim 13 wherein said computer further configured:

generate the first estimate by filtering an image gm; and generate the second estimate of inhomogeneity using an operation other than filtering.

In the same field (medical imaging) of endeavor, however, Gur discloses computerized detection of masses and micro calcifications in digital mammograms comprises filtering on an image (column 17, lines 41-49).

It would have been obvious to a person of ordinary skill in the art at this time the invention was made to use image filtering as taught by Gur in the system of Harvey because Gur provides Harvey an improved CAD system with

advantageous and useful to help radiologists and physicians obtain quicker and more precise results when analyzing mammograms. Such CAD systems would aid in cancer detection and improve the efficiency of large-scale screening.

Claim 15 is similarly analyzed as claim 3 above.

Claim 17 is similarly analyzed as claim 6 above.

Claim 18 is similarly analyzed as claim 7 above.

Claim 19 is similarly analyzed as claim 8 above.

Claim 20 is similarly analyzed as claim 9 above.

Claim 24 is similarly analyzed as claim 14 above.

Allowable Subject Matter

12. Claims 4, 5, 10-12, 16, 21-23, 27, 31 and 32are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Other prior art Cited

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Benaron et al (U S 5,752,519) disclose device and method for detection, localization, and characterization of inhomogeneities in turbid media.

Zhang et al (U S 6,263,228 B1) disclose method and apparatus for providing separate water-dominant and fat-dominant images from single scan single point Dixon MRI séquences.

Maeda et al (U S 5,113,865) disclose method and apparatus for correction of phase distortion in MR imaging system.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

15. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to ABOLFAZL TABATABAI whose telephone number is (571) 272-7458.

The Examiner can normally be reached on Monday through Friday from 9:30 a.m. to 7:30 p.m. If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Bhavesh Mehta, can be reached at (571) 272-7453. The fax phone number for organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Abolfazl Tabatabai

Patent Examiner

Technology Division 2624

September 16, 2007

A-Tabatabai

SAMIR AHMED
PRIMARY EXAMINER